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(71) Applicant *(for all designated States except US)*: ASSOCIATED PHYSICS OF AMERICA, LLC. [US/US]; Route 5, Box 718, Greenwood, MS 38930 (US).

(72) Inventors: POTGIETER, Deon, John; 803 Regency Street, Monroe, LA 71201 (US). HOPPER, Billy, Freeman; Route 2, Box 126F, Carrollton, MS 38917 (US).

(74) Agent: MOFFATT, Michael, J.; Fulwider Patton Lee & Utecht, LLP, 200 Oceangate, Suite 1550, Long Beach, CA 90802 (US).

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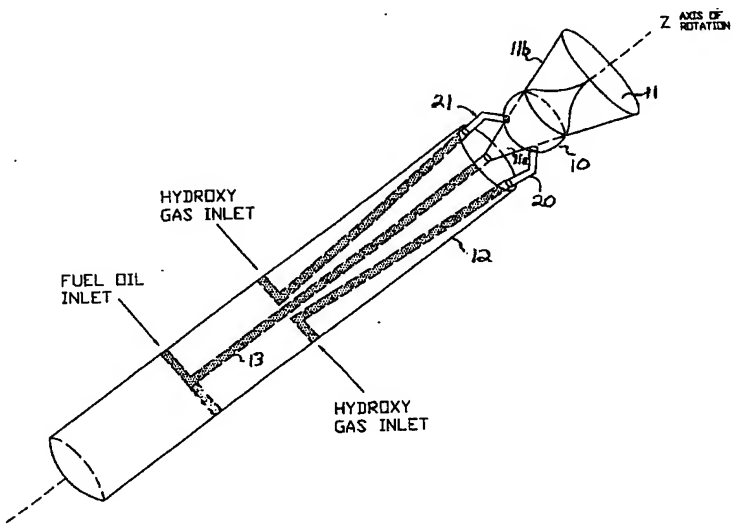
(54) Title: A METHOD AND DEVICE FOR COMBUSTING LIQUID FUELS USING HYDROGEN



(57) Abstract: A method and device for combustion of liquid fuels is presented which uses a plurality of rotating hydrogen flames to blast atomize and ignite a mechanically dispersed stream of the liquid fuel. This combustion method and device are particularly suited for heavy oil fuels, such as vegetable oils, which are not well burned using conventional burner technologies. This combustion method involves establishing a zone of combusting hydrogen and projecting a mechanically atomized dispersion of the liquid fuel into and through this zone of combusting hydrogen. The combusting hydrogen partially vaporizes and ignites the liquid fuel while the intense turbulence of the hydrogen combustion zone further disperses any remaining liquid fuel droplets. Once ignited and dispersed, the fuel oil continues to burn as it moves away from the hydrogen combustion zone. Since only a small amount of combusting hydrogen is utilized, the hydrogen can be generated by the electrolysis of water, which produces a 2:1 molar ratio of hydrogen and oxygen, or hydroxy, gas. The device implementing this combustion method is comprised of a rotating solid shaft into which one or more fuel transport tubes are bored. A series of chambers are formed around the rotating shaft to stage the fuel oil and hydroxy gas. A forward chamber is located nearest to the flame area to provide cooling and insulation of the middle hydrogen staging chamber. The fuel oil transport tube has one end on the surface of the shaft which opens into the fuel oil chamber. The other end is fitted with an atomizing nozzle which discharges into the combusting hydrogen zone. Each of the hydroxy gas transport tubes has one end on the surface of the shaft which opens into the hydroxy gas chamber and another end fitted with an angled tube that directs the gas back toward the axis of rotation. Multiple chambers can used to inject other liquid or gaseous streams into the combustion zone as desired. The burner is capable of economically producing heat energy using only vegetable oil, water and power input, which allows it to qualify as an all-renewable energy device.

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